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FLOOD INSURANCE STUDY

COMPLETED

VILLAGE OF LANSING, NEW YORK
TOMPKINS COUNTY

Ja/CDC

NOVEMBER 19, 1987

ORIGINAL
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Federal Emergency Management Agency

COMMUNITY NUMBER - 361612

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
	1.1 Purpose of Study	1
	1.2 Authority and Acknowledgements	1
2.0	AREA STUDIED	2
	2.1 Scope of Study	2
	2.2 Community Description	2
	2.3 Principal Flood Problems	2
	2.4 Flood Protection Measures	2
3.0	ENGINEERING METHODS	4
	3.1 Hydrologic and Hydraulic Analyses	4
4.0	FLOOD PLAIN MANAGEMENT APPLICATIONS	5
	4.1 Flood Boundaries	5
	4.2 Floodways	6
5.0	INSURANCE APPLICATION	6
	5.1 Reach Determinations	6
	5.2 Flood Hazard Factors	6
	5.3 Flood Insurance Zones	6
	5.4 Flood Insurance Rate Map Description	8

TABLE OF CONTENTS - continued

	Page
6.0 OTHER STUDIES	8
7.0 LOCATION OF DATA	9
8.0 BIBLIOGRAPHY AND REFERENCES	9

FIGURES

Figure 1 - Vicinity Map 3

TABLES

Table 1 - Summary of Stillwater Elevations 5

Table 2 - Flood Insurance Zone Data 7

EXHIBITS

Exhibit 1 - Flood Insurance Rate Map

FLOOD INSURANCE STUDY
VILLAGE OF LANSING, NEW YORK

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Village of Lansing, Tompkins County, New York, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study will be used to convert Lansing to the regular program of flood insurance by the Federal Emergency Management Agency (FEMA). Local and regional planners will use this study in their efforts to promote sound flood plain management.

This Flood Insurance Study was prepared by compiling pertinent information for the flood hazard areas in the Village of Lansing from existing technical and/or scientific data originally prepared by others for purposes other than the preparation of this Flood Insurance Study.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than those on which these federally-supported studies are based. These criteria take precedence over the minimum federal criteria for purposes of regulating development in the flood plain, as set forth in the Code of Federal Regulations at 44 CFR, 60.3. In such cases, however, it shall be understood that the state (or other jurisdictional agency) shall be able to explain these requirements and criteria.

1.2 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by Edwards and Kelcey Engineers, Inc., during the preparation of the Flood Insurance Study for the Town of Ithaca, New York. The Ithaca study was completed in November 1983.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Village of Lansing, Tompkins County, New York. The area of study is shown on the Vicinity Map (Figure 1).

Cayuga Lake was studied by detailed methods for its entire shoreline within the corporate limits. The areas studied by detailed methods were selected based upon the extent and validity of available existing hydrologic and hydraulic data.

2.2 Community Description

The Village of Lansing is located in the northwestern portion of Tompkins County in central New York. It is bordered by the Town of Lansing to the north and west, the Town of Ithaca and the Village of Cayuga Heights to the south, and the Town of Dryden to the east.

Cayuga Lake has a surface area of 66 square miles within a drainage area of 1,587 square miles. The outflow of the lake is controlled by the New York State Department of Transportation primarily as a source of water for the New York State Barge Canal (Reference 1). The lake discharges into the canal, which follows the Seneca River at that point.

The climate of the area is characteristic of central New York, with warm summers and cold winters and moderate to heavy snowfall. Average daily temperatures range from 23 degrees Fahrenheit (°F) in January to 69°F in July. The average annual precipitation is 34 inches, of which 14 inches become runoff (Reference 2).

2.3 Principal Flood Problems

Cayuga Lake is subject to significant flooding. Several major floods have occurred during this century, including the July 1935 event during which the level of the lake was reported to be 4.5 feet above normal, battering shoreline cottages (Reference 3). During the 1972 flood, Cayuga Lake crested a record 2.5 feet above flood level (Reference 4). A total of 6.93 inches of rain fell during the 72-hour duration of the storm.

2.4 Flood Protection Measures

There are no flood control measures or structures within the Village of Lansing.

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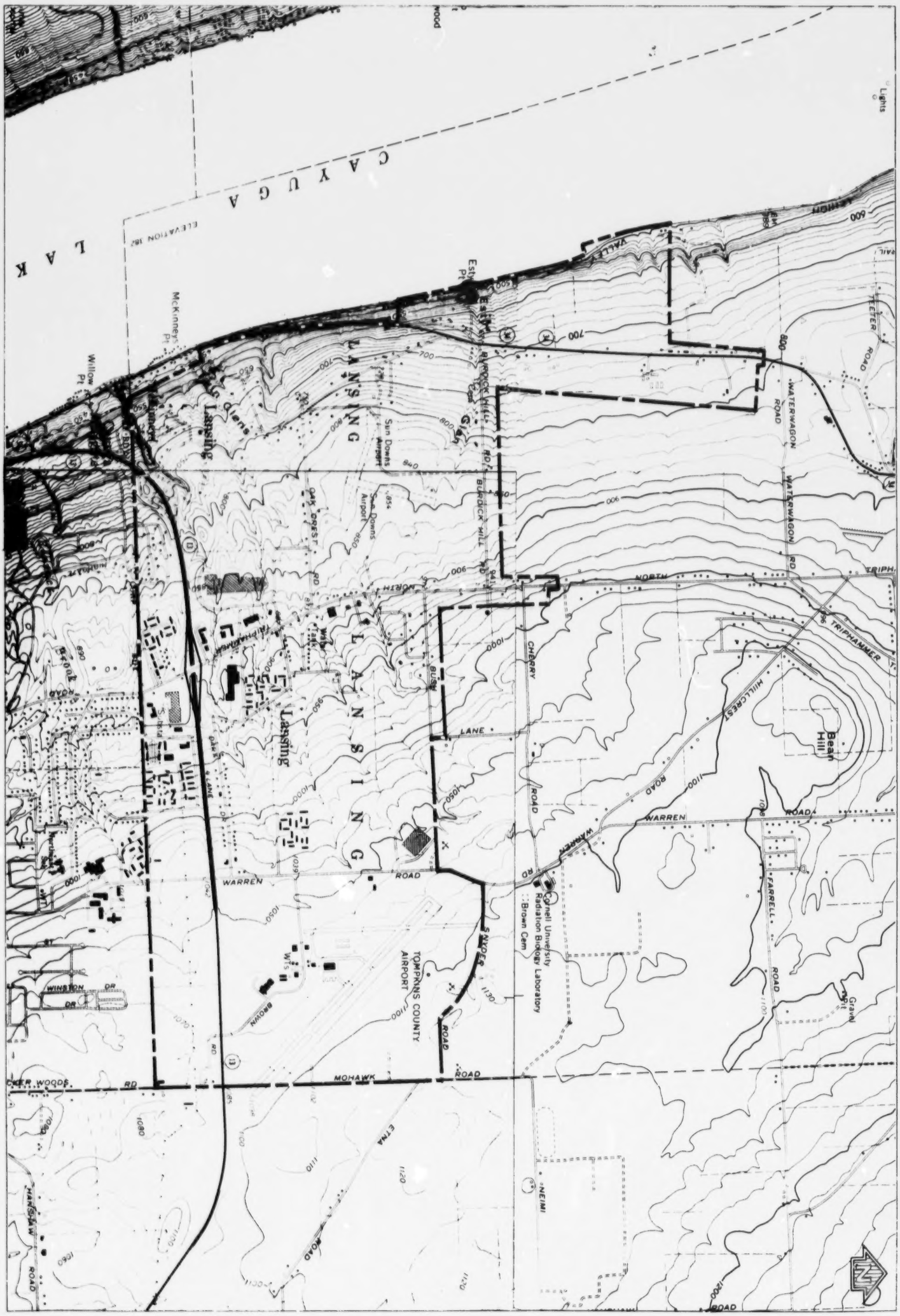

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF LANSING, NY

(TOMPKINS CO.)

APPROXIMATE SCALE

2000 0 2000 4000 6000 FEET

VICINITY MAP

3.0 ENGINEERING METHODS

For the flooding source studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic and Hydraulic Analyses

Analyses were carried out to establish the peak elevation-frequency relationships for the flooding source studied in detail affecting the community.

Elevations of the selected recurrence intervals were taken from the Flood Insurance Study for the Town of Ithaca, as determined in the Flood Insurance Study for the Village of Cayuga (References 5 and 6). In the Cayuga study, the determination of the levels of Cayuga Lake were based on a graphical analysis of stage-height measurements at the U. S. Geological Survey (USGS) gaging station (No. 04233500) located 1 mile from the mouth of Cayuga Inlet in the Town of Ithaca. The gaging station record covered a 19-year period, from 1956 to 1974 (References 7, 8, and 9). This record was extended by records of a staff gage near Cayuga on the wall of the upper pool at Mud Lock. The gage was established on October 10, 1905, and is operated by the New York State Department of Transportation (Reference 10). This extension was made on the observation that the records of the two gages coincided for the overlapping years. Data from the extended record were ranked in descending order of magnitude and assigned Weibull plotting positions.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps.

A summary of peak elevation-frequency relationships for Cayuga Lake is shown in Table 1, "Summary of Stillwater Elevations."

TABLE 1 - SUMMARY OF STILLWATER ELEVATIONS

FLOODING SOURCE AND LOCATION	ELEVATION (feet) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
CAYUGA LAKE				
Entire shoreline within Lansing	384.8	385.8	386.3	387.2

The storm-surge elevations for the 10-, 50-, 100-, and 500-year floods have been determined for Cayuga Lake. The analyses reported herein reflect the stillwater elevations, but do not include the contributions from wave heights or wave runup. Nonetheless, these additional hazards should be considered in planning future development.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages State and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study produces maps designed to assist communities in developing flood plain management measures.

4.1 Flood Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for flood plain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the flooding source studied in detail, the 100- and 500-year flood plain boundaries have been delineated using topographic maps (Reference 11).

The 100- and 500-year flood plain boundaries are shown on the Flood Insurance Rate Map (Exhibit 1). In cases where the 100- and 500-year flood plain boundaries are close together, only the 100-year flood plain boundary has been shown. Small areas within the flood plain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

The floodway is the channel of a stream, plus any adjacent flood plain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights.

The concept of a floodway does not apply in areas of lacustrine flooding. Therefore, no floodway was computed or delineated for this study.

5.0 INSURANCE APPLICATION

To establish actuarial insurance rates, data from the engineering study must be transformed into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors, and flood insurance zone designations for the flooding source studied in detail in the Village of Lansing.

5.1 Reach Determinations

Reaches are defined as sections of flood plain that have relatively the same flood hazard. In lacustrine areas, reaches are limited to the distance for which the 100-year flood elevation does not vary more than 1.0 foot. Using these criteria, one reach was required for the flooding source of the Village of Lansing. The location of this reach is shown on the Flood Insurance Rate Map and summarized in Table 2.

5.2 Flood Hazard Factors

The Flood Hazard Factor (FHF) is used to establish relationships between depth and frequency of flooding in any reach. This relationship is then used with depth-damage relationships for various classes of structures to establish actuarial insurance rate tables.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations rounded to the nearest one-half foot, multiplied by 10, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year flood water-surface elevations is greater than 10.0 feet, it is rounded to the nearest whole foot.

5.3 Flood Insurance Zones

Flood insurance zones and zone numbers are assigned based on the type of flood hazard and the FHF, respectively. A unique zone number is

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FHF	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10 YR.)	2% (50 YR.)	0.2% (500 YR.)			
Cayuga Lake Reach 1	01	-1.5	-0.5	+0.9	015	A3	386

[1]Flood Insurance Rate Map Panel
[2]Weighted Average
[3]Rounded to the nearest foot - see map

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF LANSING, NY

(TOMPKINS CO.)

FLOOD INSURANCE ZONE DATA

CAYUGA LAKE

associated with each possible FHF, and varies from 1 for a FHF of 005 to a maximum of 30 for a FHF of 200 or greater.

Zone A3: Special Flood Hazard Areas inundated by the 100-year flood; with base flood elevations shown, and zones subdivided according to FHFs.

Zone B: Areas between the Special Flood Hazard Areas and the limits of the 500-year flood; areas that are protected from the 100- or 500-year floods by dike, levee, or other water control structure; areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.

Zone C: Areas of minimal flooding; not subdivided.

Flood elevation differences, FHFs, flood insurance zones, and base flood elevations for the flooding source studied in detail in the community are shown in Table 2.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the Village of Lansing is, for insurance purposes, the principal result of the Flood Insurance Study. This map contains the official delineation of flood insurance zones and base flood elevations. Base flood elevation lines show the locations of the expected whole-foot water-surface elevation of the base (100-year) flood. The base flood elevations and zone numbers are used by insurance agents, in conjunction with structure elevations and characteristics, to assign actuarial insurance rates to structures and contents insured under the National Flood Insurance Program.

6.0 OTHER STUDIES

This Flood Insurance Study was prepared by compiling existing hydrologic and hydraulic technical and scientific data prepared originally for purposes other than the preparation of this study. The data was identified as the best available at the time of compilation of this Flood Insurance Study and should depict the general conditions of the flooding sources with relative accuracy. FEMA performed a cursory review and accepted the data as valid for purposes of this Flood Insurance Study and the NFIP. However, if better information is known to exist or has been developed since the date of this report, the

information should be immediately forwarded to the Natural and Technological Hazards Division, Federal Emergency Management Agency (Regional Director, Region II Office, 26 Federal Plaza, Room 19-100, New York, New York 10278) for consideration for revision of this study.

A Flood Plain Information report for Cayuga Lake was prepared by the Buffalo District of the U. S. Army Corps of Engineers (COE) in 1967 (Reference 12). The data from the report was subsequently updated by the COE in a 1973 report on Tropical Storm Agnes (Reference 10).

Flood Insurance Studies for the Towns of Ithaca and Lansing are currently being prepared (References 5 and 13). The results of those studies will be in exact agreement with the results of this study.

This study is authoritative for purposes of the Flood Insurance Program, and the data presented here either supersede or are compatible with previous determinations.

7.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, 26 Federal Plaza, Room 1351, New York, New York 10278.

8.0 BIBLIOGRAPHY AND REFERENCES

1. State of New York, Water Resources Administration, Reconnaissance of Water Resources Potential for Central New York Area, Albany, New York, August 1966.

2. R. S. Mordoff, Cornell Miscellaneous Bulletin 33, The Climate of New York State, Ithaca, New York, 1959.

3. The Ithaca Journal, Ithaca, New York, Volume 120, Number 158, Page 1, July 9, 1935.

4. The Ithaca Journal, Ithaca, New York, Volume 158, Number 149, June 25, 1972.

5. Federal Emergency Management Agency, Flood Insurance Study, Town of Ithaca, Tompkins County, New York (Unpublished).

6. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Village of Cayuga, Cayuga County, New York, Washington, D. C., January 5, 1977.

7. U. S. Department of the Interior, Geological Survey, Water-Supply Paper 1727, Compilation of Records of Surface Waters of the United States, October 1950 to September 1960, Part 4. St. Lawrence River Basin, Washington, D. C., 1961.

8. U. S. Department of the Interior, Geological Survey, Water-Supply Paper 1912, Surface Water Supply of the United States, 1961-1965, Part 4. St. Lawrence River Basin, Washington, D. C., 1966.

9. U. S. Department of the Interior, Geological Survey, Water Resources Data for New York, Part 1, Surface Water Records, 1 -1974, Albany, New York, 1975.

10. U. S. Army Corps of Engineers, Buffalo District, Report of Flood, Tropical Storm Agnes, June 1972, Oswego River Basin, Buffalo, New York, August 1973.

11. U. S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 20 Feet: Ludlowville, New York, 1971; West Groton, New York, 1970, Photoinspected 1976; Contour Interval 10 Feet: Ithaca East, New York, 1969, Photorevised 1978; Ithaca West, New York, 1969.

12. U. S. Army Corps of Engineers, Buffalo District, Flood Plain Information, Cayuga Lake, New York, Buffalo, New York, June 1967.

13. Federal Emergency Management Agency, Flood Insurance Study, Town of Lansing, Tompkins County, New York (Unpublished).